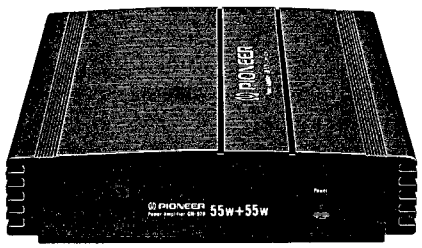
PIONEER®
The Art of Entertainment

Service Manual

• GM-920/EW



ORDER NO.
CRT1406

POWER AMPLIFIER

GM-920

EW, ES

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SPECIFICATIONS

Power source	14.4 V DC (10.8 - 15.6 V allowable)
Grounding system	Negative type
Current consumption	7 A (at continuous power, 4Ω)
Average current drawn *	2.2 A (4Ω) 3.3 A (2Ω)
Fuse	10 A
Dimensions	160 (W) x 41 (H) x 190 (D) mm [6-1/4 (W) x1-5/8 (H) x 7-1/2 (D) mm]
Weight	1.6 kg (3.5 lbs.) (Leads for wiring not included)
Maximum power output	55 W x 2 (EIAJ)
Continuous power output	
	25 W x 2 (at 4Ω, 20 - 20,000 Hz, 0.5% THD)
	35 W x 2 (at 2Ω, 20 - 20,000 Hz, 0.5% THD)
Load impedance	4 Ω (2 – 8 Ω allowable)
Frequency response	10 - 50,000 Hz (+0 dB, -1 dB)
Signal-to-noise ratio	94 dB (IEC-A network)
Distortion	0.015 % (at 10 W, 1 kHz)
Separation	60 dB (1 kHz)

GM-920/ES

Input level	0.2 - 2 V /8 kΩ

GM-920/EW

Input Level	RCA: 0.2 - 2 V /8 kΩ DIN: 100 mV / 22 kΩ

These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committee of Car Stereo Manufacturers.

Note:
Specifications and the design are subject to possible modification without notice due to improvements.

* Average current drawn
The average current drawn is nearly the maximum current drawn by this unit when an audio signal is input. Use this value when working out total current drawn by multiple power amplifiers.

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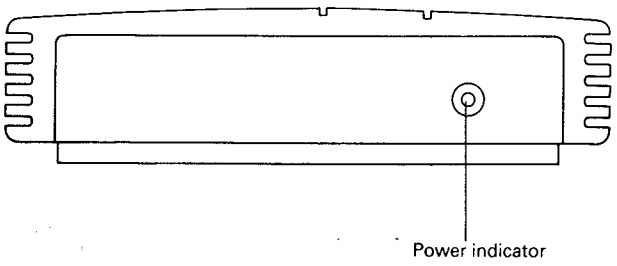
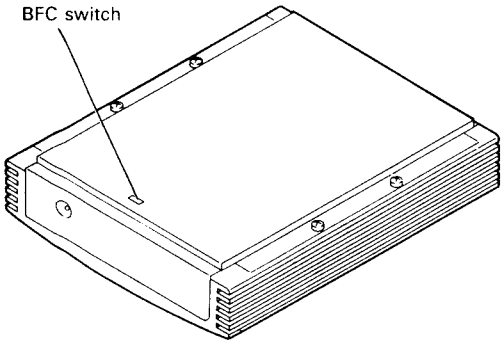
1. CONTROLS AND THEIR USE

Power Indicator
The power indicator lights when the power is switched on.

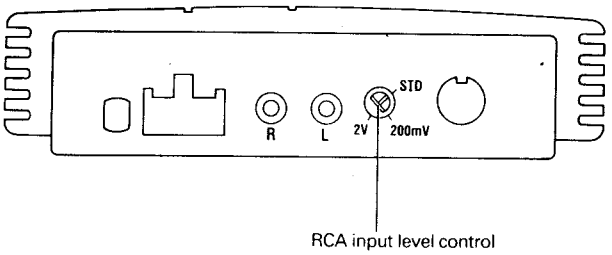


BFC (Beat Frequency Control) switch
If beating is heard when listening to AM stations on your car radio, change the position of the BFC switch on the bottom of the amplifier with a small flat-bladed screwdriver.



RCA input level control
The RCA input control level is used to adjust the RCA input level. If the amplifier is connected to a Pioneer car component with RCA pin jacks, set the RCA level control to the STD position. If the amplifier is connected to a non-Pioneer car stereo conponent with RCA pin jacks, adjust the input level as shown in Fig. 1.

- If the amplifier is connected to a Pioneer car stereo component with DIN sockets, the RCA input level control is not used.



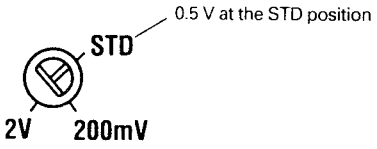


Fig. 1

2. DISASSEMBLY

- Remove the Heat Sink
  1. Remove the four screws A and four screws B.
  2. Remove the three screws C and then remove the heat sink.

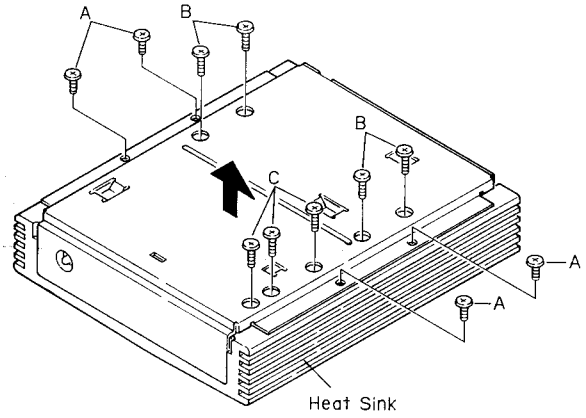


Fig. 2

- Remove the Amp Unit
  1. Remove the two screws D and a screw E.
  2. Remove the panel.
  3. Unbend the claw indicated by arrow until straight.
  4. Remove the two screws F and then remove the amp unit.

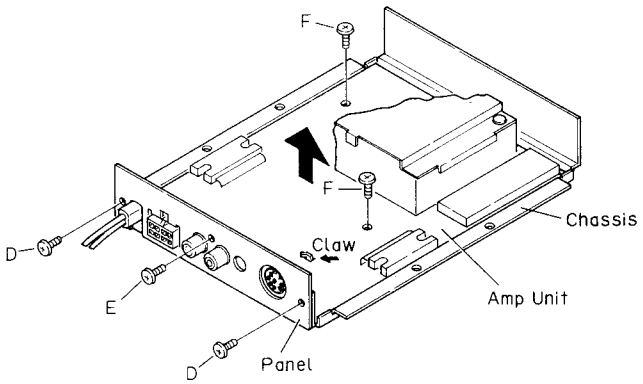
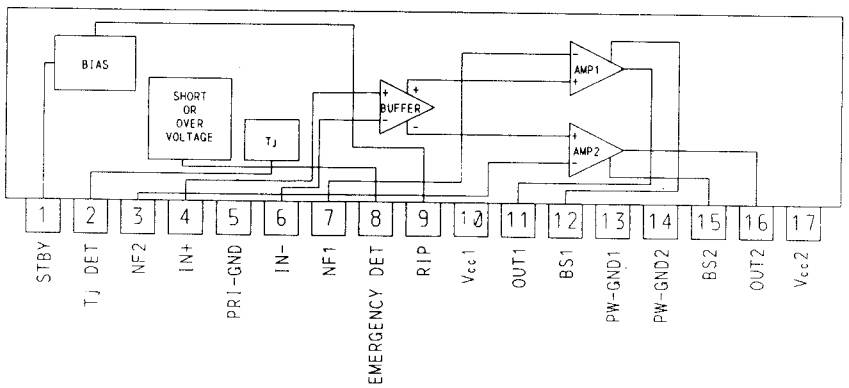


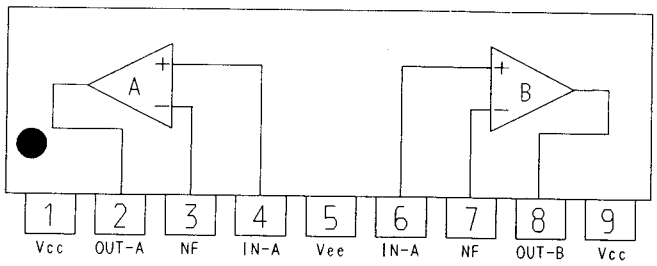
Fig. 3

•ICs

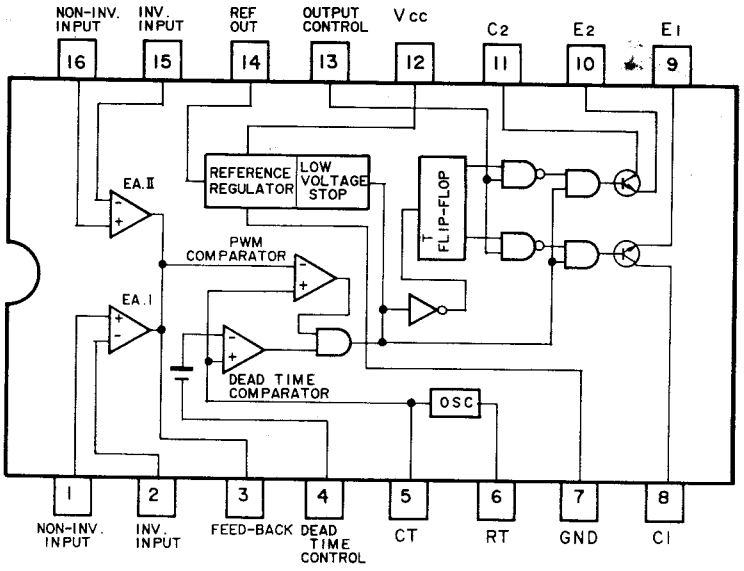
TA8225L



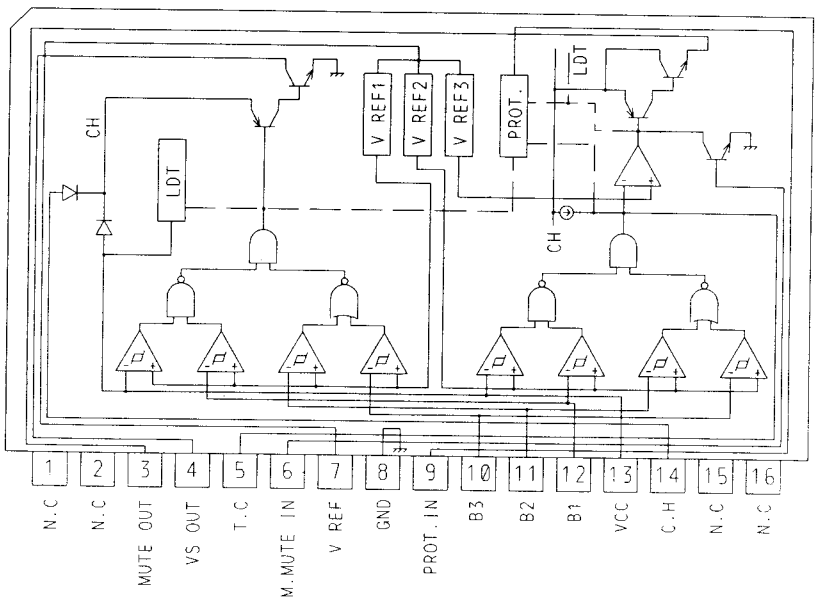
UPC4570HA



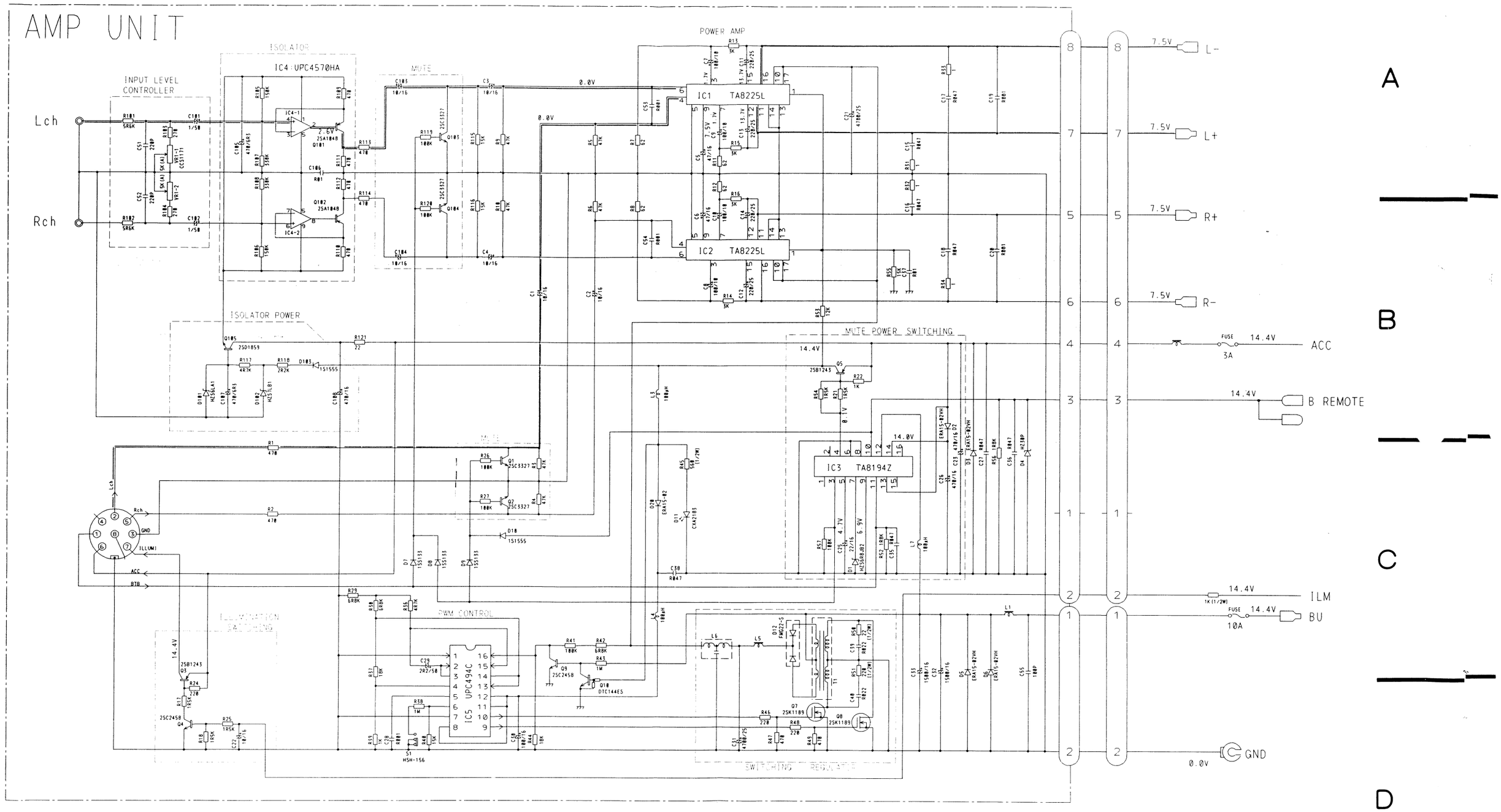
UPC494C



TA8194Z



3. SCHEMATIC CIRCUIT DIAGRAM (GM-920/EW)



NOTE:

Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

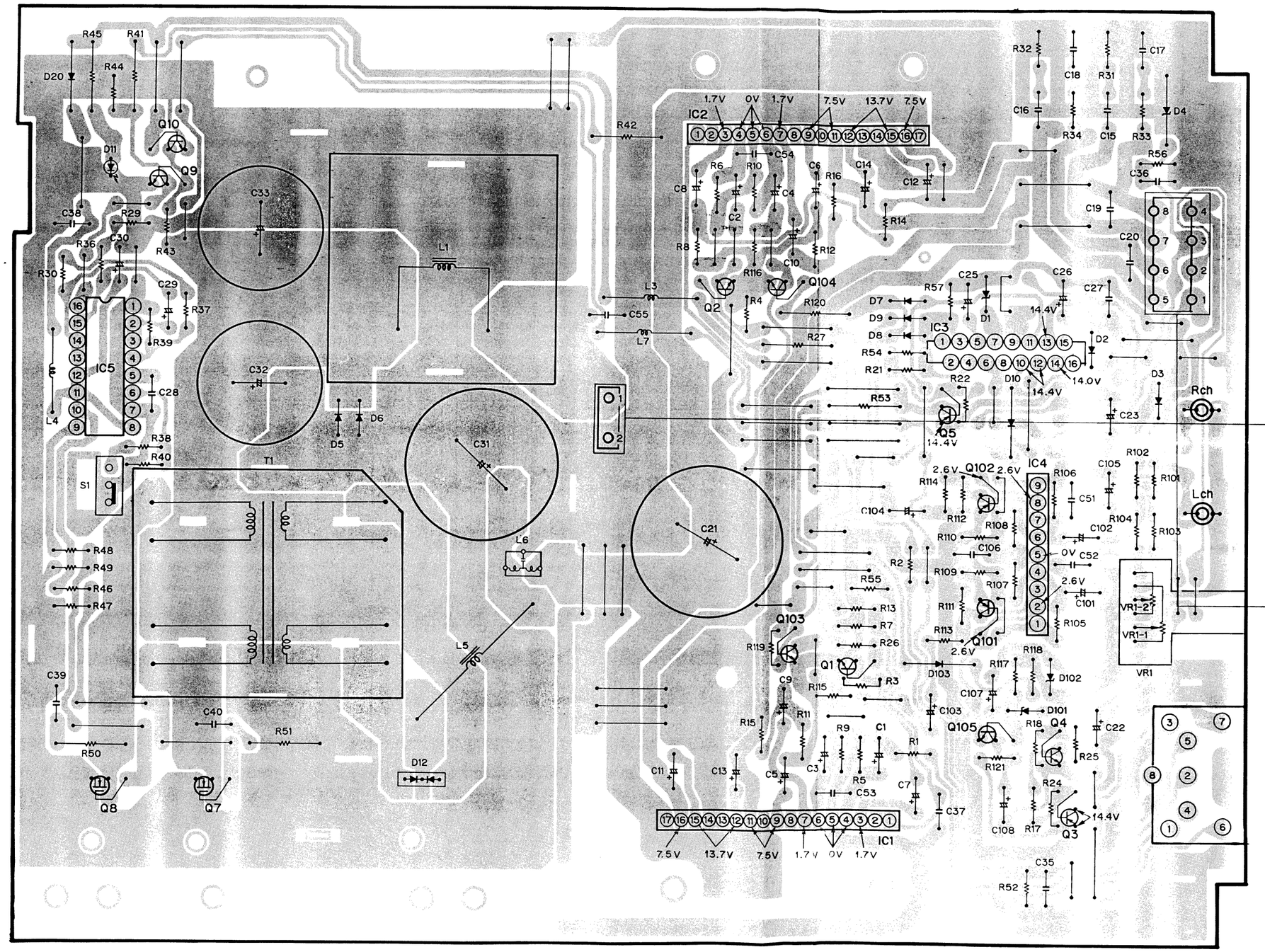
SWITCH
AMP UNIT
S1 BFC SWITCH • • • • • • • LOW-HIGH
The underlined indicates the switch position.

Fig. 4

4. CONNECTION DIAGRAM (GM-920/EW)

AMP UNIT

IC. Q IC5 Q8 Q9 Q10 Q7 IC2 IC1 Q2 Q104 Q103 Q1 IC3 Q5 Q102 IC4 Q101 Q105 Q4 Q3



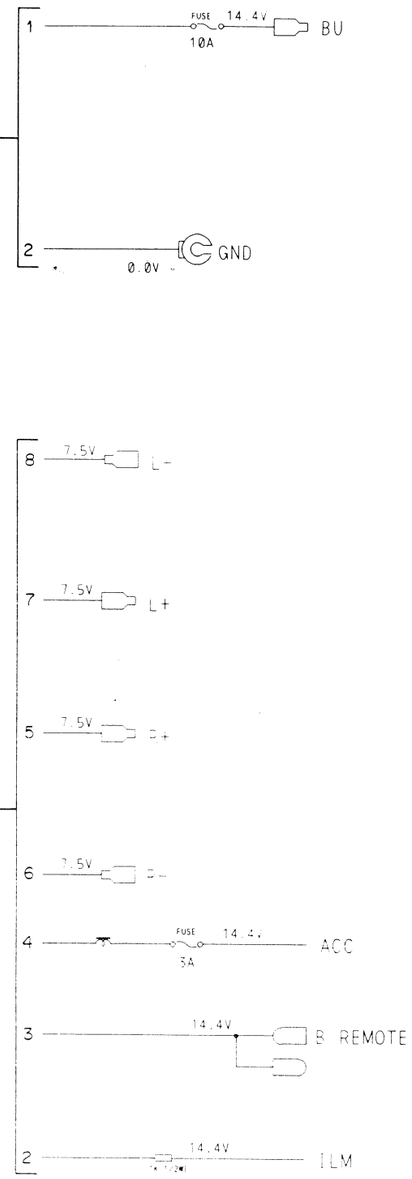
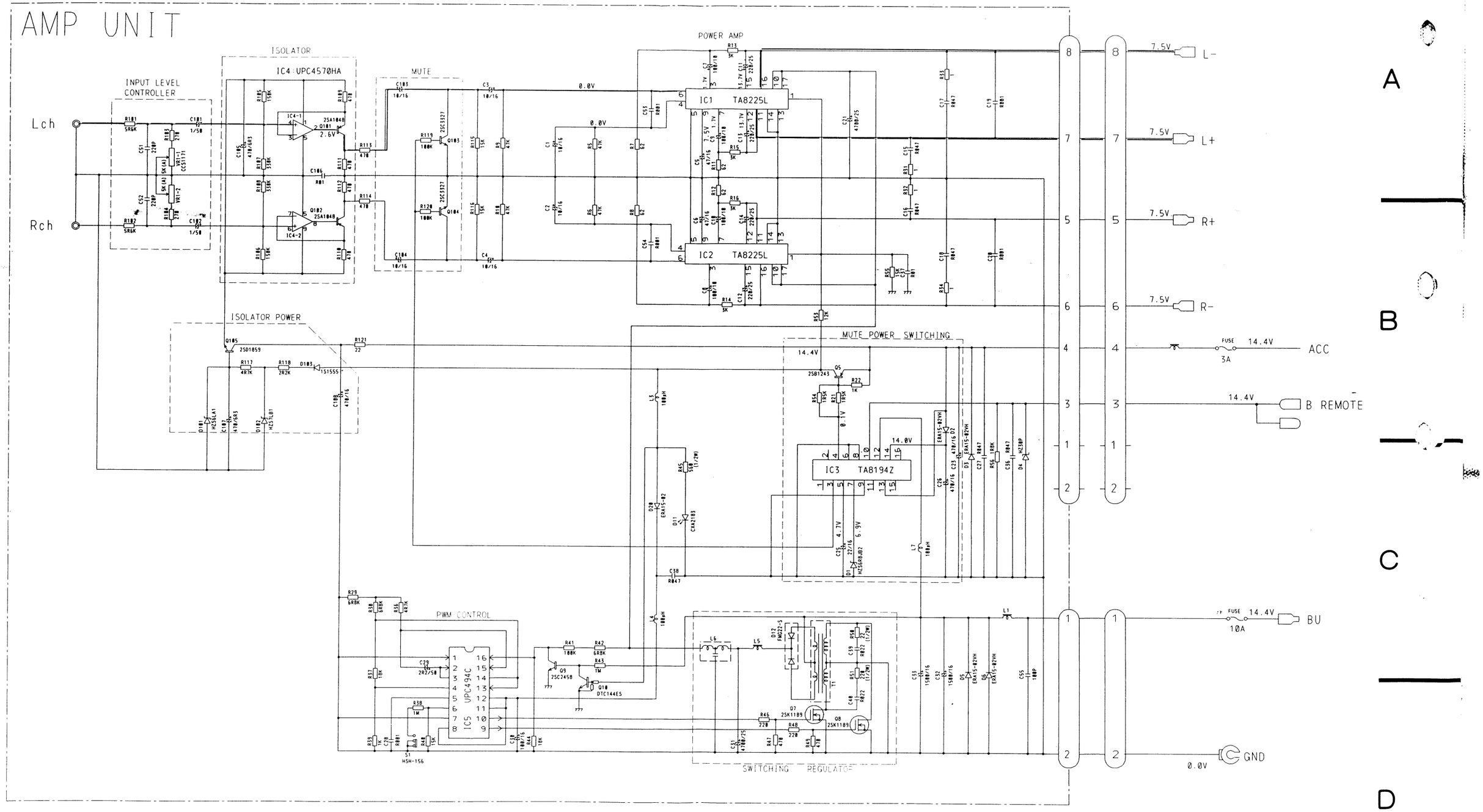


Fig. 5

5. SCHEMATIC CIRCUIT DIAGRAM (GM-920/ES)



NOTE

Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

SWITCH
AMP UNIT
S1:BFC SWITCH • • • • • • • LOW-HIGH
The underlined indicates the switch position.

Fig. 6

6. CONNECTION DIAGRAM (GM-920/ES)

AMP UNIT

IC, Q IC5 Q8 Q9 Q10 Q7 IC2 IC1 Q104 Q103 IC3 Q102 IC4 Q5 Q101 Q105

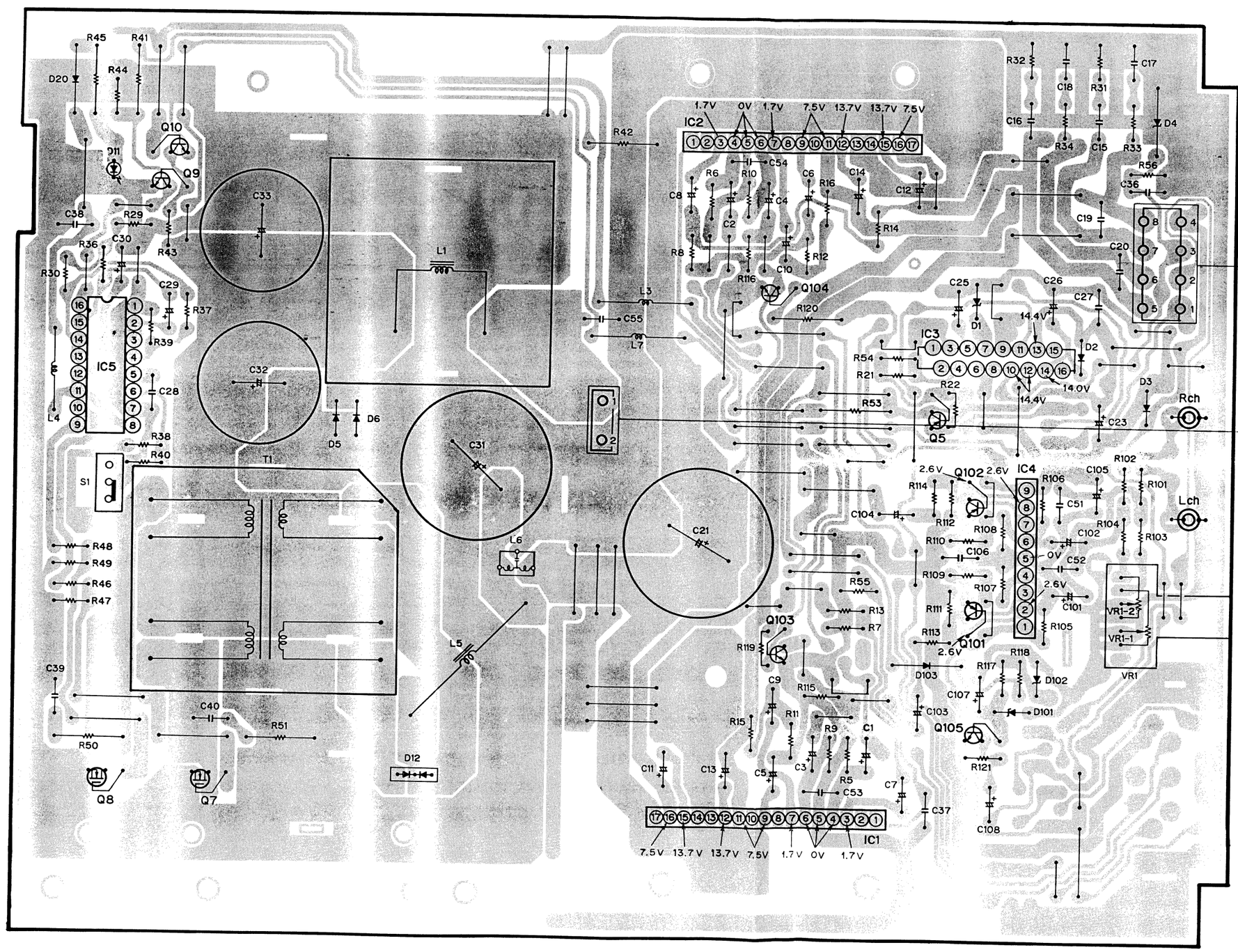


Fig. 7

7. EXPLODED VIEW

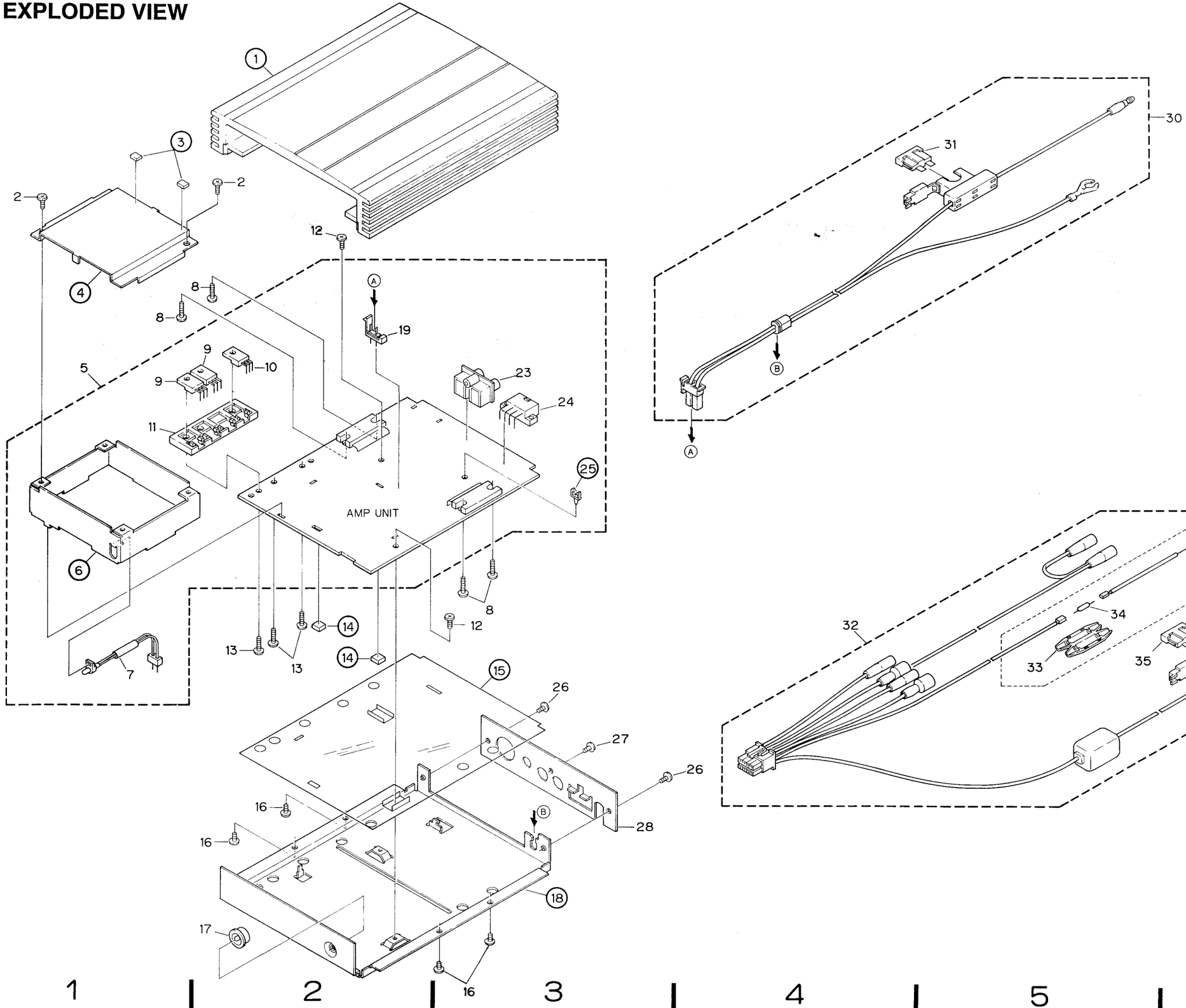


Fig. 8

NOTE:
- *The parts marked with "◉" may need long time to supply and their supply is subject to refuse as the case may be.*
- *Because the parts with encircled number shown on the dismantling drawing are not spare parts, we are unable to supply them in principle.*

•Parts List

Mark	No.	Description		Part No.
	1	Heat Sink	(UC)	CNR1220
		Heat Sink	(EW, ES)	CNR1204
	2	Screw		BMZ30P040FMC
	3	Spacer		CNM3198
	4	Holder		CNC3728
◉	5	Amp Unit	(UC, ES)	CWH1123
◉		Amp Unit	(EW)	CWH1121
	6	Holder		CNC3720
	7	LED Assy (D11)		CXA2183
	8	Screw		CBA1162
	9	FET (Q7, Q8)		2SK1189
	10	Diode (D12)		FMG22-S
	11	Holder		CNV2757
	12	Screw		BSZ30P050FMC
	13	Screw		CBA1178
	14	Cushion		CNM2456
	15	Insulator		CNM3029
	16	Screw		BMZ30P050FZK
	17	Lens		CNV2756
	18	Chassis	(UC)	CNA1392
		Chassis	(EW, ES)	CNA1369
	19	Connector		CKS2100
	20	Holder	(EW)	CNC3719
	21	Screw	(EW)	BMZ20P080FMC
	22	Connector	(EW)	CKS1156
	23	Jack		CKB1005
	24	Connector		CKM1079
	25	Clamper		CNV1335
	26	Screw		CBA1182
	27	Screw		BPZ30P060FZK
	28	Panel	(UC, ES)	CNB1502
		Panel	(EW)	CNB1461
	29	·····		
	30	Cord Assy		CDE3398
	31	Fuse (10A)		CEK1136
	32	Cord Assy	(UC, ES)	CDE3282
		Cord Assy	(EW)	CDE3281
	33	Cap	(EW)	CNS1472
	34	Resistor	(EW)	RS1/2PS102JL
	35	Fuse (3A)		CEK1134

8. PACKING METHOD

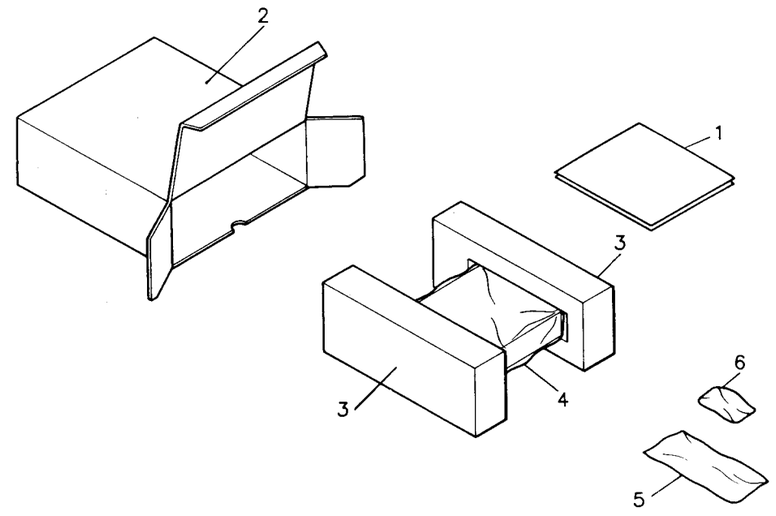


Fig. 9

•Parts List

* : Non Spare Part

Mark	No.	Description		Part No.
	1-1	Owner's Manual	(EW)	CRD1472
		Owner's Manual	(ES)	CRD1473
*	1-2	Card	(EW)	CRY-062
	2	Carton	(EW)	CHG2017
		Carton	(ES)	CHG2018
	3	Styrofoam		CHP1414
	4	Polyethylene Bag		CEG-162
	5	Cord Assy	(ES)	CDE3282
		Cord Assy	(EW)	CDE3281
	6	Accessory Assy		CEA1603
	6-1	Screw (×4)		BYC40P120FZK
	6-2	Bracket (×2)		CNC3420
	6-3	Fastener (×2)		CNM-667

NOTE:
Owner's Manual

Part No.	Model	Language
CRD1472	GM-920/EW	English, French, German, Spanish, Swedish, Norwegian, Dutch, Italian, Finnish
CRD1473	GM-920/ES	English, French, Spanish, Arabic

9. ELECTRICAL PARTS LIST

NOTE:

- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*

Chip Resistor
RS1/8S□□□J, RS1/10S□□□J
Chip Capacitor (except for CQS.....)
CKS....., CCS....., CSZS.....

•GM-920/ES

Unit Number :
Unit Name : Amp Unit

MISCELLANEOUS

Mark	Circuit Symbol & No.	Part Name	Part No.
IC	1 2		TA8225L
IC	3		TA8194Z
IC	4		UPC4570HA
IC	5		UPC494C
Q	5		2SB1243
Q	7 8		2SK1189
Q	9		2SC2458
Q	10		DTC144ES
Q	101 102		2SA1048
Q	103 104		2SC3327
Q	105		2SD1859
D	1		HZS6R8JB2
D	2 3 5 6		ERA15-02VH
D	4		HZ30P
D	11	LED Assy	CXA2183
D	12		FMG-22S
D	20		ERA15-02
D	101		HZS6LA1
D	102		HZS7LB1
D	103		1S1555
L	1	Choke Coil	CTH1033
L	3 4 7	Coil 100μH	CTF-113
L	5	Choke Coil	CTH1036
L	6	EMI Filter	CCG-081
T	1	Transformer	CTT1010
S	1	Switch(BFC)	HSH-156
VR	1	Volume 5kΩ (A)	CCS1171

RESISTORS

Mark	Circuit Symbol & No.	Part Name	Part No.
R	5 6 9 10		RD1/4PS473JL
R	7 8 11 12		RD1/4PS620JL
R	13 14 15 16		RD1/4PS302JL
R	21 54		RD1/4PS152JL
R	22 39		RD1/4PS102JL
R	29 30		RD1/4PS682JL
R	31 32 33 34		RD1/4PS010JL
R	36 117		RD1/4PS472JL
R	37 44		RD1/4PS183JL
R	38 43		RD1/4PS105JL
R	40 55 115 116		RD1/4PS153JL
R	41 120		RD1/4PM104J
R	42		RD1/4PM682J
R	45		RD1/2PS561JL
R	46 48		RD1/4PS221JL
R	47 49 109 110 111 112 113 114		RD1/4PS471JL
R	50 51		RD1/2PS220JL
R	53		RD1/4PM123J
R	56		RD1/4PS182JL
R	57 119		RD1/4PS104JL
R	101 102		RD1/4PS562JL
R	103 104		RD1/4PS271JL
R	105 106		RD1/4PS154JL
R	107 108		RD1/4PS334JL
R	118		RD1/4PS222JL
R	119		RD1/4PS104JL
R	121		RD1/4PS220JL

CAPACITORS

Mark	Circuit Symbol & No.	Part Name	Part No.
C	1 2 3 4 103 104		CEA100M16L2
C	5 6		CEA470M16L2
C	7 8 9 10		CEA101M10L2
C	11 12 13 14		CEA221M25L2
C	15 16 17 18		CQMA473J50
C	19		CKPYB102K50L
C	20		CKCYB102K50
C	21 31	4700μF/25V	CCH1121
C	23 26 108	470μF/16V	CCH-114
C	25		CEA220M16L2
C	27		CKCYF473Z50
C	28		CQPA102J2A
C	29		CEA2R2M50L2
C	30		CEA101M16L2
C	32 33	1500μF/16V	CCH1021
C	36		CKPYF473Z50L
C	37		CKPYF103Z25L
C	38		CKPYF473Z50L
C	39 40		CQMA223J50
C	51 52		CKPYB221K50L
C	53 54		CKCYB102K50
C	55		CCCSL101J50
C	101 102		CEA010M50L2
C	105 107		CEA471M6R3L2
C	106		CQMA103J50

•GM-920/EW

Unit Number :
Unit Name : Amp Unit

MISCELLANEOUS

Mark	Circuit Symbol & No.	Part Name	Part No.
IC	1 2		TA8225L
IC	3		TA8194Z
IC	4		UPC4570HA
IC	5		UPC494C
Q	1 2		2SC3327
Q	3		2SB1243
Q	4		2SC2458
Q	5		2SB1243
Q	7 8		2SK1189
Q	9		2SC2458
Q	10		DTC144ES
Q	101 102		2SA1048
Q	103 104		2SC3327
Q	105		2SD1859
D	1		HZS6R8JB2
D	2 3 5 6		ERA15-02VH
D	4		HZ30P
D	7 8 9		1SS133
D	10		1S1555
D	11	LED Assy	CXA2183
D	12		FMG-22S
D	20		ERA15-02
D	101		HZS6LA1
D	102		HZS7LB1
D	103		1S1555
L	1	Choke Coil	CTH1033
L	3 4 7	Coil 100μH	CTF-113
L	5	Choke Coil	CTH1036
L	6	EMI Filter	CCG-081
T	1	Transformer	CTT1010
S	1	Switch(BFC)	HSH-156
VR	1	Volume 5kΩ (A)	CCS1171

RESISTORS

Mark	Circuit Symbol & No.	Part Name	Part No.
R	1 2		RD1/4PS471JL
R	3 4		RD1/4PS473JL
R	5 6 9 10		RD1/4PS473JL
R	7 8 11 12		RD1/4PS620JL
R	13 14 15 16		RD1/4PS302JL
R	17 18 25		RD1/4PS152JL
R	21 54		RD1/4PS152JL
R	22 39		RD1/4PS102JL
R	35		RD1/4PS221JL
R	26		RD1/4PS104JL
R	27		RD1/4PM104J
R	29 30		RD1/4PS682JL
R	31 32 33 34		RD1/4PS010JL
R	35		RD1/4PS221JL
R	36 117		RD1/4PS472JL
R	37 44		RD1/4PS183JL
R	38 43		RD1/4PS105JL
R	40 55 115 116		RD1/4PS153JL
R	41 120		RD1/4PM104J
R	42		RD1/4PM682J
R	45		RD1/2PS561JL
R	46 48		RD1/4PS221JL
R	47 49 109 110 111 112 113 114		RD1/4PS471JL
R	50 51		RD1/2PS220JL
R	52		RD1/4PS182JL
R	53		RD1/4PM123J
R	56		RD1/4PS182JL
R	57 119		RD1/4PS104JL
R	101 102		RD1/4PS562JL
R	103 104		RD1/4PS271JL
R	105 106		RD1/4PS154JL
R	107 108		RD1/4PS334JL
R	118		RD1/4PS222JL
R	121		RD1/4PS220JL

CAPACITORS

Mark	Circuit Symbol & No.	Part Name	Part No.
C	1 2 3 4 103 104		CEA100M16L2
C	5 6		CEA470M16L2
C	7 8 9 10		CEA101M10L2
C	11 12 13 14		CEA221M25L2
C	15 16 17 18		CQMA473J50
C	19		CKPYB102K50L
C	20		CKCYB102K50
C	21 31	4700μF/25V	CCH1121
C	23 26 108	470μF/16V	CCH-114
C	25		CEA220M16L2
C	27		CKCYF473Z50
C	28		CQPA102J2A
C	29		CEA2R2M50L2
C	30		CEA101M16L2
C	32 33	1500μF/16V	CCH1021
C	36		CKCYF473Z50
C	37		CKPYF473Z50L
C	38		CKPYF103Z25L
C	39 40		CKPYF473Z50L
C	51 52		CQMA223J50
C	53 54		CKPYB221K50L
C	55		CKCYB102K50
C	101 102		CCCSL101J50
C	105 107		CEA010M50L2
C	106		CEA471M6R3L2
			CQMA103J50

10. CONNECTING THE UNITS

Connect the components as shown in the diagram.

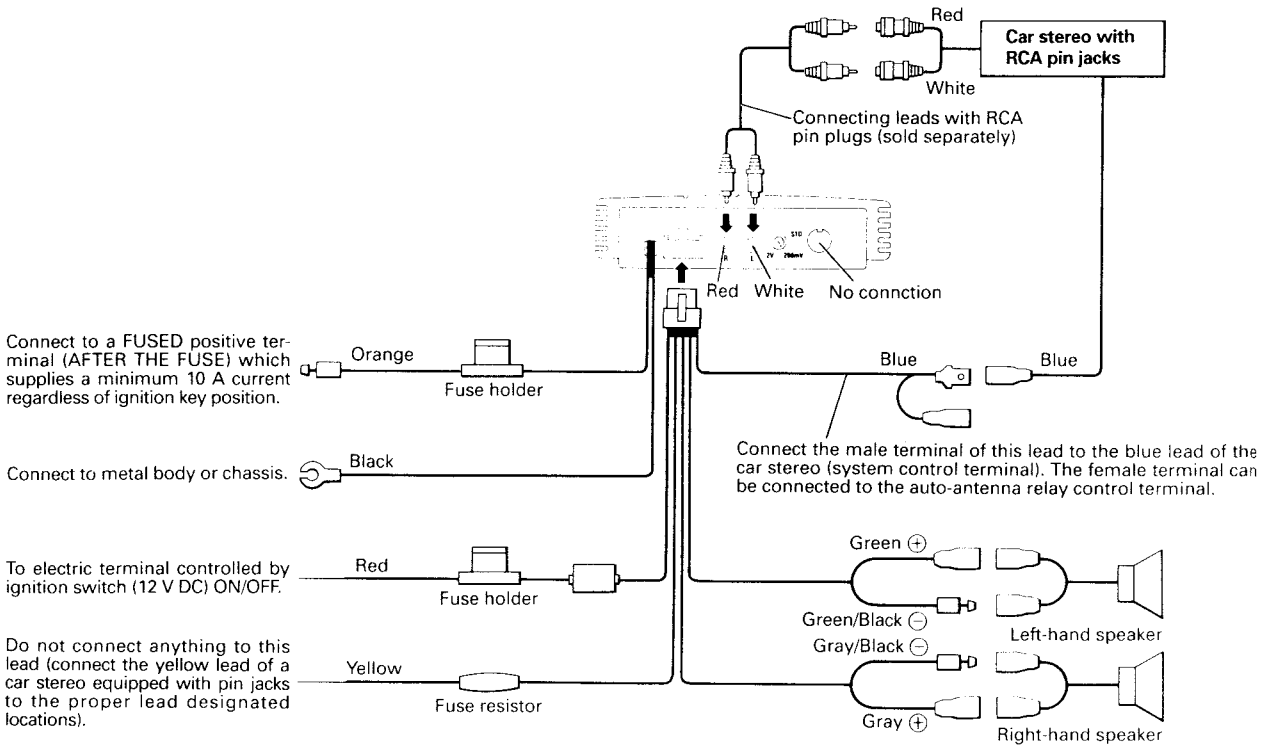
- Before finalizing installation, turn everything on, and make sure everything works correctly and that no noise is getting into the system.
- When routing leads and cords, secure them with cable retainers and electrician's adhesive tape. Also, to prevent any damage to the insulation on the leads and cords, protect them with electrician's adhesive tape wherever they may touch sharp edges.
- Keep all wiring away from hot surfaces or heater outlets to prevent short circuits.
- It is recommended that the speakers connected to the amplifier have the ratings shown below, or higher. If a speaker has a rating below that recommended, it may be damaged when the volume is turned up. The speaker impedance must be 2 to 8 ohms.

Speaker ratings	
Maximum	55 W
Nominal	25 W

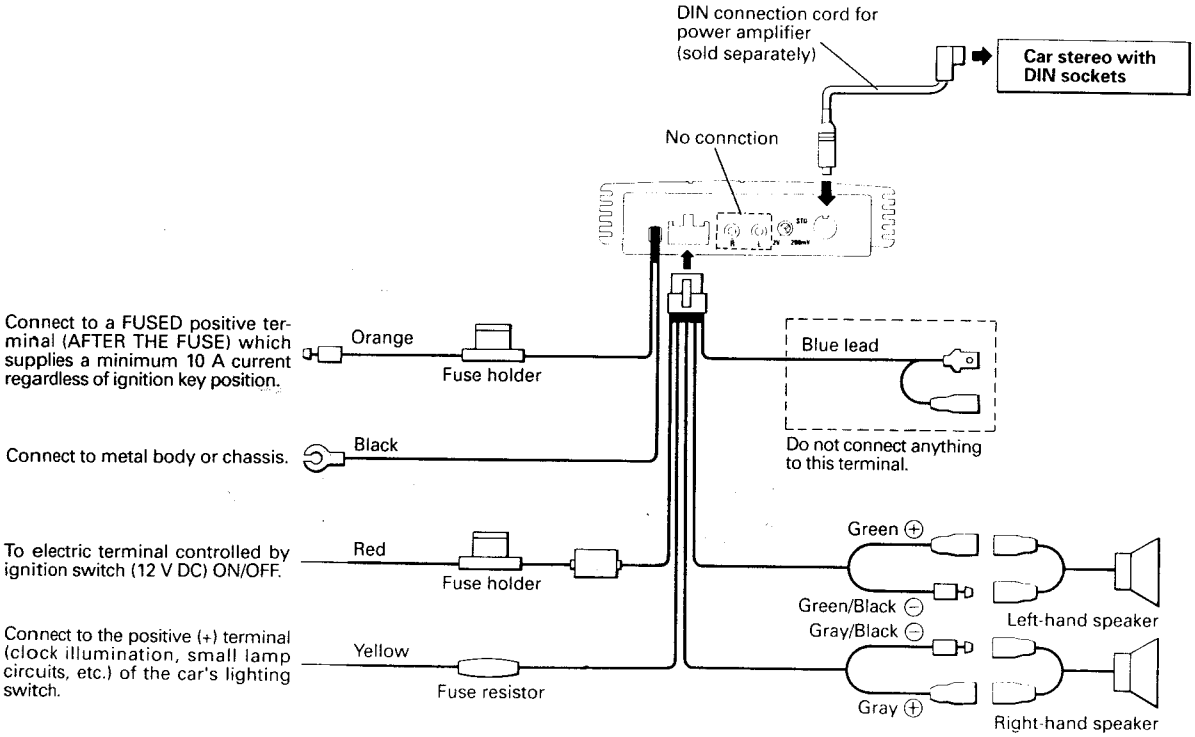
In the case of a full-range speaker, use one whose maximum rating is higher than the maximum rating shown. In the case of a sub-woofer, use one whose nominal rating is higher than the nominal rating shown.

- Never connect a speaker lead to ground or to other speaker grounds. The protection circuitry will operate instantaneously, turning off the amplifier.
- To prevent noise problems, keep the amplifier and its power leads away from signal cords, speaker leads, and the antenna cord.
- Amplifier ground leads (black) should be connected to a solid metal part of the vehicle body. If using multiple amplifiers, connect all amplifier ground leads to the same point to prevent noise problems. To get good contact when grounding, you may have to sand away the paint to expose the metal underneath.
- To operate the amplifier and car stereo properly, connect the continuous power supply lead (orange) and the accessory power lead (red) correctly. If the leads are not connected correctly or are not connected at all, the amplifier and car stereo will not work.
- To connect the amplifier to the RCA pin jacks of a car stereo component, use an audio cord with RCA pin plugs. To connect the amplifier to the DIN socket of a car stereo component, use a DIN connection cord. Both kinds of cord are available from your dealer.
- For detailed information on connections between different units and the amplifier, see the owner's manuals for the units, and follow their recommendations precisely.

When Combined with a Car Stereo with RCA Pin Jacks


Red
Car stereo with RCA pin jacks
White
Connecting leads with RCA pin plugs (sold separately)
Red
White
No connction
Connect to a FUSED positive terminal (AFTER THE FUSE) which supplies a minimum 10 A current regardless of ignition key position.
Orange
Fuse holder
Blue
Blue
Connect to metal body or chassis.
Black
Connect the male terminal of this lead to the blue lead of the car stereo (system control terminal). The female terminal can be connected to the auto-antenna relay control terminal.
To electric terminal controlled by ignition switch (12 V DC) ON/OFF.
Red
Fuse holder
Green ⊕
Green/Black ⊖
Gray/Black ⊖
Left-hand speaker
Do not connect anything to this lead (connect the yellow lead of a car stereo equipped with pin jacks to the proper lead designated locations).
Yellow
Fuse resistor
Gray ⊕
Right-hand speaker

When Combined with a Car Stereo with DIN Sockets


DIN connection cord for power amplifier (sold separately)
Car stereo with DIN sockets
No connction
Connect to a FUSED positive terminal (AFTER THE FUSE) which supplies a minimum 10 A current regardless of ignition key position.
Orange
Fuse holder
Blue lead
Do not connect anything to this terminal.
Connect to metal body or chassis.
Black
To electric terminal controlled by ignition switch (12 V DC) ON/OFF.
Red
Fuse holder
Green ⊕
Green/Black ⊖
Left-hand speaker
Gray/Black ⊖
Connect to the positive (+) terminal (clock illumination, small lamp circuits, etc.) of the car's lighting switch.
Yellow
Fuse resistor
Gray ⊕
Right-hand speaker